PROC. ENTOMOL. SOC. WASH.
109(1), 2007, pp. 45–51

BIOLOGY AND DESCRIPTION OF A NEW SPECIES OF *LAURELLA* HERATY (HYMENOPTERA: EUCHARITIDAE) FROM ARGENTINA

Javier Torréns, John M. Heraty, and Patricio Fidalgo

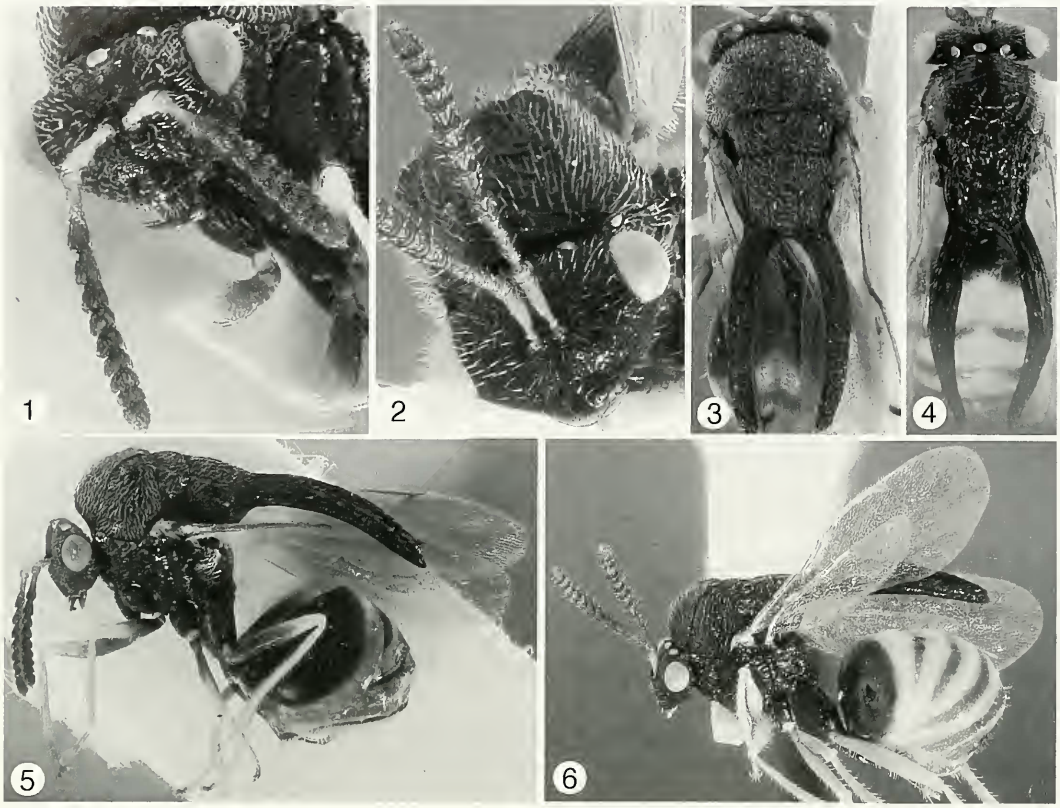
(JT, PF) CRILAR-CONICET, Entre Ríos y Mendoza, 5301 Anillaco, La Rioja, Argentina (e-mails: jtorrens@crilar-conicet.com.ar; pfidalgo@crilar-conicet.com.ar); (JMH) Department of Entomology, University of California, Riverside, CA 92521, USA (e-mail: john.heraty@ucr.edu)

Abstract.—Description of the adult, egg, and planidium of a **new species**, ***Laurella rugosa*** **Torréns, Heraty, and Fidalgo** (Hymenoptera: Eucharitidae), from Salta, Argentina, is provided, along with a new key for the species of the genus. *Laurella rugosa* deposits eggs on the underside of leaves of *Serjania glabrata* Kunth (Sapindaceae), a climbing plant that grows in the understory of *Piptadenia macrocarpa* Benth. (Leguminoceae).

Key Words: *Laurella rugosa*, egg, planidium, host plant

Laurella (Hymenoptera: Eucharitidae) was initially described to include three species, *L. bonariensis* (Gemignani), *L. vianai* (Gemignani), and *L. guriana* Heraty (Heraty 2002). Two of these species were described by Gemignani (1947) as *Lirata bonariensis* and *Parakapala vianai*. *Laurella* belongs to the largely Neotropical Kapala clade within the Eucharitinae, which usually can be recognized by the parallel elongate projections arising from the scutellum (Heraty 2002). Oviposition takes place with the deposition of large numbers of eggs, either in cavities in plant buds or with the eggs scattered over the undersurface of the leaf (Clausen 1940a, Heraty and Darling 1984, Heraty 2002). All members of the *Kapala* clade are known to only attack the immature stages of large poneromorph ants in the subfamilies Ectatomminae, Ponerinae, and Paraponerinae (*sensu* Bolton 2003). Larvae initially attach to the host larva, but most development occurs on the host pupa (Clausen 1940b).

The biology of *Laurella* was unknown, and its immature stages undescribed, with the exception of a single planidium taken from the body of an adult of *L. vianai* from Tucumán, Argentina (Heraty 2002). The larva was similar in morphology to that of a closely related genus, *Thoracantha* Latreille, with both genera sharing elongate channels on the cranium (Heraty 2002). Attachment of larvae to the adult host is relatively common in eucharitids attacking poneromorph ants and is associated with highly active larvae seeking an adult ant host for phoretic transfer back to the brood in the ant nest. These active planidia may attach accidentally to an adult eucharitid visiting oviposition sites used by other females of the same species; thus, these attached planidia on the eucharitid adult are likely from the same species (Heraty, unpublished).



Figs. 1–6. 1, *Laurella rugosa*, head and antenna (female, sublateral). 2, *L. guriana*, head and antenna (female, frontal). 3, *L. rugosa*, head and mesosoma (female, dorsal). 4, *L. guriana*, head and mesosoma (female, dorsal). 5, *L. rugosa*, habitus (female). 6, *L. guriana*, habitus (female).

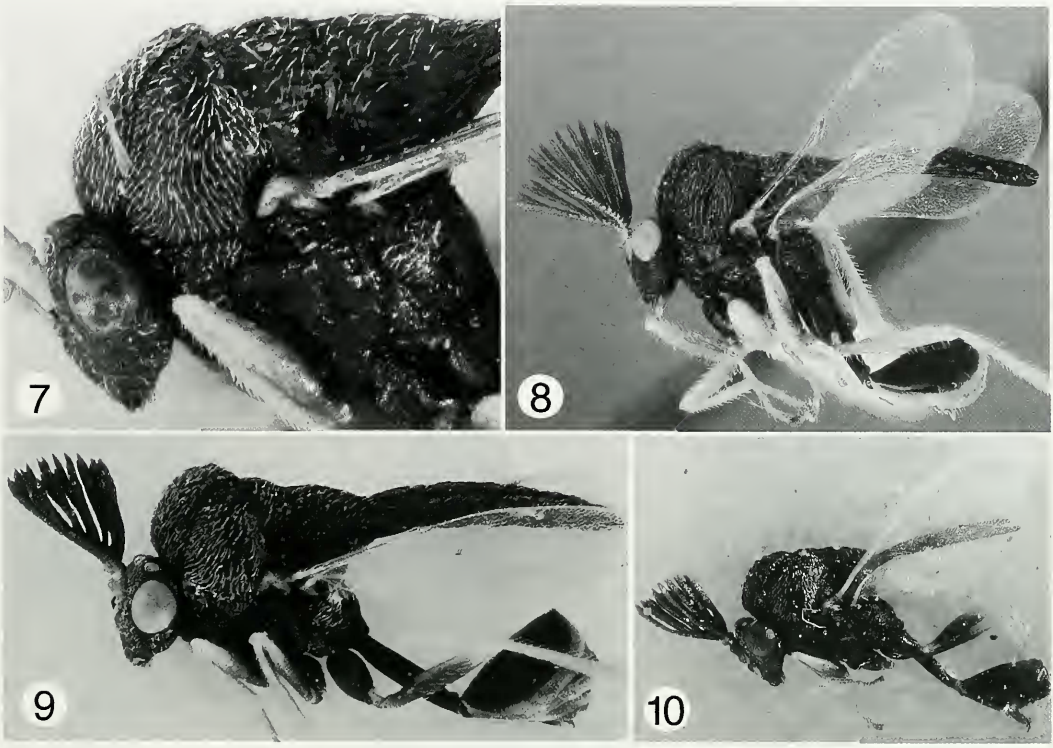
Laurella is known only from South America, with scattered locality records from Argentina, Paraguay, Uruguay, and Venezuela. A new species, *Laurella rugosa*, was discovered in northern Argentina, and information is included on its life history and immature stages. Morphological terms used in the descriptions are from Heraty (2002) and Darling (1988), with details on sculpture from Eady (1968).

Type material is deposited in the following collections: MACN, Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina; IFML, Instituto Fundación Miguel Lillo, Tucumán, Argentina; FSCA, Florida State Collections of Arthropods, Gainesville, Florida, U.S.A.; UCRC, University of California, Riverside, California, U.S.A.

Laurella rugosa Torréns, Heraty, and Fidalgo, new species

(Figs. 1, 3, 5, 7, 9, 11–20)

Diagnosis.—Distinguished from the other species by a combination of semiappressed setae on the head and mesosoma, darkened femora basally, and thick scutellar spines that are slightly bowed in dorsal view (Fig. 3). Additionally, females have an elongate basal flagellomere that is lightly colored basally, and the mesoscutum is strongly rounded in profile (Fig. 5). The egg is stalked and similar to other Eucharitinae as described by Heraty and Darling (1984). The planidium is almost identical



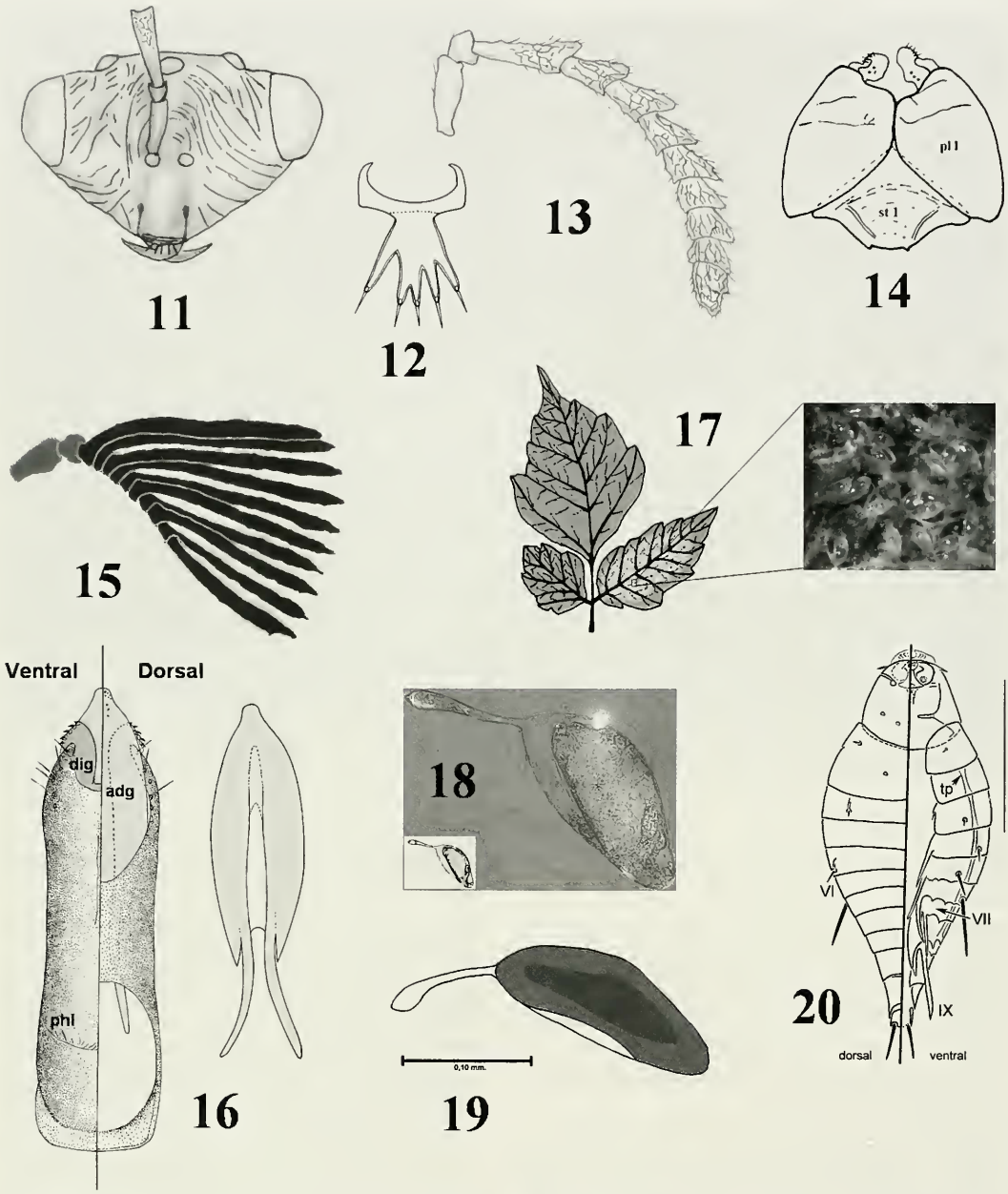
Figs. 7–10. 7, *Laurella rugosa*, head and mesosoma (female, lateral). 8, *L. guriana*, habitus (male). 9, *L. rugosa*, habitus (male). 10, *L. bonariensis*, habitus (male).

to that of *Thoracantha striata* Perty (Heraty 2002), with both planidia having a distinct line extending laterally from anterior cranial sensilla and presense of a seta ventrally on T1. *Laurella rugosa* differs by having a seta ventrally on TI and no ventral or lateral seta on TII. As well, the ventral posterior process on TIX is divided and developed laterally in *L. rugosa*.

Holotype female.—Length 3.6 mm. Body completely black except light brown tegula; scape, pedicel, basal half of F2 light brown, rest of flagellum dark brown; femora dark brown basally, distal half of femora, tibiae, and tarsi yellow. Wings evenly infuscate with venation dark brown.

Head: 1.5× as broad as high (Figs. 1, 11). Face with surface weakly scabrous and with weak striae converging from genae to clypeus, and from lower face to median ocellus (Fig. 11). Eyes separated by 2.4× their height. Labrum with five digits, each digit with a terminal flattened seta (Fig. 12). Clypeus smooth; supraclypeal area swollen, slightly reticulate with a few weak transverse striae. Antenna with 11 segments (Figs. 1, 13), scape swollen apically, not reaching to ventral margin of median ocellus. Length of flagellum 1.5× height of head, basal flagellomere 6.2× as long as basal width, 1.9× as long as following segment; basal flagellomere flared apically, following segments flared and weakly serrate apically, clava rounded; all flagellar segments scabrous.

Mesosoma (Figs. 3, 5): Mesoscutum rounded anteriorly; midlobe with irregular transverse carinae, and with weak longitudinal depression medially; side lobe with similar carinae but less distinct; entire surface covered by semi-appressed



Figs. 11–20. 11–14, *Laurella rugosa* (female). 11, Head (frontal). 12, Labrum. 13, Antenna. 14, Prosternum and propleura (ventral). 15–16, *L. rugosa* (male). 15, Antenna. 16, Genitalia and aedeagus. 17–20, Host plant and immature stages. 17, Underside of *Serjania glabrata* with eggs (white area). 18, Recently deposited egg. 19, Egg two days old with outline of planidium. 20, Planidium. Abbreviations: pl_I= propleura; st_I= prosternum; adg= aedeagus; dig= digitus; phl= phallobase; tp= tergopleural line.

setae; tegula with scattered setae. Notauli vaguely impressed anteriorly to strongly impressed posteriorly. Axilla, scutellum, and scutellar spine with strong longitudinal striae, sculpture becoming rugose in posterior half of spine, spines slightly bowed in dorsal view (Fig. 3); frenum glabrous and smooth, reflexed below

spines and with a medial carina. Propodeal disc rounded and slightly rugose, with a broad medial depression. Mesepisternum glabrous and smooth; upper mesepimeron weakly reticulate to smooth dorsally, becoming more strongly rugose-areolate ventrally, femoral depression deeply and narrowly impressed and with strong tranverse carinae; prepectus triangular and separated from tegula by mesoscutum and acropleuron (Fig. 7). Prosternum (st1) trapezoidal with two carina directed medially (Fig. 14). Forecoxa mostly smooth and bare, becoming reticulate with scattered setae anteriorly; midcoxa mostly smooth two lateral longitudinal carina; hind coxa smooth to slightly reticulated apically, with few setae, hind coxa 1.8× as long as broad. Forewing 2.5× as long as broad; stigmal vein rectangular, 2.4× as long as broad; postmarginal vein as long as stigmal vein.

Metasoma: Petiole 3.1× as long as broad and 1.3× as long as hind coxa, petiole mostly smooth with weak longitudinal carinae. Gastral terga black to brown, terga smooth; Gt_1 with few scattered curved setae; hypopygium with cluster of dense long hairs apically.

Variation.—Length 3.5–3.8 mm. Head 1.4–1.5× as broad as high; eyes separated by 1.9–2.6× their height. Length of flagellum 1.5–1.6× height of head, basal flagellomere 5–6.2× as long as basal width and 1.5–1.9× as long as following segment. Labrum with 5–6 digits. Depression of midlobe weak to almost absent. Tegula whitish to light brown. Scutellar spine with variation in breadth, and more than apical half can be rugose. Frenum with 1–3 carinae in different forms. Hind coxa 1.6–1.9× as long as broad. Forewing 2.4–2.6× as long as broad. Petiole 2.7–3.2× as long as broad and 1.3–1.5× as long as hind coxa.

Male.—Length 3.3–3.6 mm (Fig. 9). Similar to female except for following: head with sculpture more prominent; mesosoma with carinae more irregular; scutellar spine almost completely rugous; mesepisternum and mesepimeron with carinae prominent and surface more evenly rugose-areolate; legs with same coloration as female but darker; antenna pectinate (Figs. 9, 15), with same coloration as female but darker, branch of basal flagellomere equal or shorter than height of head and 3.5–4.4× as long as scape; mesoscutum more vaulted in lateral view; forewing hyaline; petiole 1.6–1.8× as long as hind coxa. Gastral terga black and more slender. Genitalia (Fig. 16) typical of most Eucharitidae; volsellus with several small marginal spines, aedeagus subacuminate.

Description of immatures.—*Eggs*: Undeveloped eggs whitish and translucent with a smooth chorion, slightly flattened ventrally along egg body, and convex dorsally (Figs. 18, 19). Within four days, dark coloration of developing embryo noticed, giving egg a dark color (Fig. 19); length of egg body about 0.17 mm and caudal stalk 0.08 mm. In mature eggs, larva occupies almost entire egg body with head oriented to caudal stalk. *Planidium* (Fig. 20): Morphology and setal pattern is typical of most Eucharitinae. Described by following features: length 0.10 mm; width 0.03 mm; pleurostomal spine present; three pairs of placoid sensilla on cranium, anterior pair connected to lateral margin by single line of weakness, dorsal cranial spines absent; hatchet-shaped sclerite present; pleurostoma extending laterally as a distinct spine; ventral transverse process of cranium fingerlike and separated medially; tergopleural line (tp) separating pleural and dorsal tergites present on tergites TII–VIII; TI and TII fused dorsally, with 1 pair of small setae ventrally and dorsally with one anterolateral pair of setae and 1 medial pair of placoid sensilla; TIII with three pairs of setae; TIV with 1 setae lateral to tp; TVI with one small pair of dorsolateral setae and one pair of stout

seta medial to tp; TVII with minute seta on ventral margin; TIX entire and with two long lateral processes ventrally, lateral process reaching beyond TXI; caudal cerci not quite as long as TXI+XII and stiff.

Type material.—Holotype female: Argentina, SALTA: Termas de Rosario de la Frontera, 24/I/04, Coll. J. Torréns and P. Fidalgo. Deposited in MACN. Paratypes: SALTA: Termas de Rosario de la Frontera, Hotel Termal, 25°50′14″S 64°55′55″W, 899 m, 21/III/2003, P. Fidalgo, H03-10b, sclerophyll forest, UCR DNA voucher #1073 (1 ♀, 8 ♂, UCRC specimen numbers 91466, 91828–91834, 92210); same data, collector J. Heraty, UCR DNA voucher #1092 (2 ♀, UCRC specimen 91820–91821); Termas de Rosario de la Frontera, 15/IV/2003, J. Torréns and P. Fidalgo (1 ♀, 3 ♂, FSCA); 10/XI/03, J. Torréns and P. Fidalgo (1 ♀, IFML); 07/I/2004, J. Torréns and P. Fidalgo (1 ♂, IFML); 24/I/04, J. Torréns and P. Fidalgo (7 ♀, 4 ♂, MACN); 10/II/04, J. Torréns and P. Fidalgo (3 ♀, 1 ♂ UCRC); 07/III/2004, J. Torréns and P. Fidalgo (1 ♂, IFML); TUCUMÁN: Tapia, 14/I/1993, Cuezzo and Fidalgo (M.T.) (1 ♂, IFML).

Distribution.—Argentina: Salta, Tucumán.

Biology

Location and habitat.—Specimens were collected in Los Baños, Rosario de la Frontera (Salta: Argentina), within 500 m of the Hotel Termas. The host plant, *Serjania glabrata* Kunth (Sapindaceae), grows in the understory of a forest of "cebil colorado," *Piptadenia macrocarpa* Benth. (Leguminosae). The host plant are small shrubs approximately 60 cm high, dispersed between the trees in the collected place. Adults of *L. rugosa, S. glabrata,* and the potential host ants were collected in 2003 and 2004. All of the adults of *L. rugosa* were collected in the same location, mainly close to or on the host plant. Most adults were collected January 24, 2004. The ant host is unknown, however nests of *Odontomachus chelifer* (Latreille) (Formicidae: Ponerinae) were common near the host plant, *S. glabrata. Odontomachus* Latreille is a common host for the *Kapala* clade (Heraty 2002).

Life history.—In experimental trials, females were offered leaves of *S. glabrata*, and oviposition observed with a magnifying glass. Leaves with eggs were subsequently put in a glass container with dampened cotton. Females collected in January and February of 2004 that were provided the host plant, deposited their eggs on the underside of the leaves (Fig. 17). A single gravid female oviposited about 25 eggs per 1 mm² on one leaf. Eggs hatched within 6 days; however, many of the remaining eggs contained mature, darkened planidia that did not hatch.

Key to Species of *Laurella* Heraty

1. Semi-erect setae on head and mesosoma (Figs. 2, 4, 6, 8) . . . . . *guriana* Heraty
– Appressed setae on head and mesosoma (Figs. 1, 3, 5) 2
2 (1). Side lobe of mesoscutum smooth dorsally. Scape reaching ventral margin of median ocellus. Antenna yellow. Petiole in female as long as hind coxa. Male unknown . . . . . *vianai* (Gemigniani)
– Side lobe of mesoscutum carinate or rugose. Scape not reaching ventral margin of median ocellus. Antenna dark brown or bicolored. Petiole in female longer than hind coxa 3
3 (2). Scutellum longitudinally carinate, carinae reaching to apex of scutellar spine; carina twisted along scutellar spine. Coxae black, rest of legs yellow. Antenna dark brown (Fig. 10); male with branch of basal flagellomere 1.5–2.6× as long as scape; female funicle not serrate. Petiole in female 2.0× as long as hind coxa . . *bonariensis* (Gemigniani)
– Scutellum with irregular longitudinal carinae, spines becoming rugose apically (Fig. 3). Coxae and basal two-thirds of femora dark, distally yellow (Fig. 5). Antenna with scape, pedicel and basal half of basal flagellomere light brown, rest of flagellum dark brown (Figs. 5,

15); male with branch of basal flagellomere 3.5–4.4× as long as scape; female funicle serrate (Fig. 13). Petiole in female 1.3–1.5× as long as hind coxa . . . . . *rugosa*, n. sp.

Acknowledgments

This investigation was funded by Project PIP 702/8 of CONICET. We thank Dr. Fabiana Cuezzo for identifications of the ants, Lic. Alberto Slanis for identifications of the plants, and Dr. Arturo Roig who very kindly loaned the specimens in the Museo de Ciencias Naturales "Bernardino Rivadavia."

Literature Cited

Bolton, B. 2003. Synopsis and classification of Formicidae. Memoirs of the American Entomological Institute 71: 1–370.

Clausen, C. P. 1940a. The oviposition habits of the Eucharidae (Hymenoptera). Journal of the Washington Academy of Sciences 12: 504–516.

———. 1940b. The immature stages of the Eucharidae. Proceeding of the Entomological Society of Washington 42: 161–170.

Darling, D. C. 1988. Comparative morphology of the labrum in Hymenoptera: the digitate labrum of Perilampidae and Eucharitidae (Chalcidoidea). Canadian Journal of Zoology 66: 2811–2835.

Eady, R. D. 1968. Some illustrations of microsculpture in the Hymenoptera. Proceedings of the Royal Entomological Society of London (A) 43: 66–72.

Gemignani, E. V. 1947. Nuevas especies de la Familia "Eucharidae" (Insecta, Hymenop. Chalcid.). Comunicaciones del Museo Argentino de Ciencias Naturales, Serie Ciencias Zoológicas 1: 1–15.

Heraty, J. M. 2002. A Revision of the genera of Eucharitidae (Hymenoptera: Chalcidoidea) of the World. Memoirs of the American Entomological Institute 68: 1–359.

Heraty, J. M. and D. C. Darling. 1984. Comparative morphology of the planidial larvae of Eucharitidae and Perilampidae (Hymenoptera: Chalcidoidea). Systematic Entomology 9: 309–328.